

Development Proposals within the River Mease Catchment: Interim Advice for Local Planning Authorities

Fourth issue including standing advice on Sustainable Urban Drainage Systems (SUDS)

Purpose

The purpose of this advice note is to provide information to help local planning authorities to determine planning applications within the River Mease catchment. This fourth issue replaces previous standing advice by updating the situation regarding the Developer Contribution Scheme (DCS) which has now reached its limit; provides information on recent rulings affecting Habitat Regulations; and provides details on Sustainable Urban Drainage Systems (SUDS) provision.

This is intended for the use of the following local authorities located within the Mease catchment: North West Leicestershire District Council, South Derbyshire District Council, Lichfield District Council and Hinckley & Bosworth Borough Council.

A. Dealing with Planning Applications in the River Mease Catchment

1. The Current Situation

The River Mease is designated as a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI). At present the phosphate levels within the river mean that the water quality does not meet the conservation targets for the SAC and so it is termed as being in “unfavourable condition”. New development within the catchment has the potential to further contribute to the poor water quality as a result of surface and foul water entering the river, its tributaries and the water environment.

2. Previous Approach

The previous approach to this issue, agreed by the Mease Catchment Partnership, was to set up a Developer Contribution Scheme (DCS)¹, which was a requirement of the River Mease SAC Water Quality (Phosphate) Management Plan (WQMP). It applied to all development which contributed additional wastewater via the mains sewerage network to a sewage treatment works which discharges into the catchment. Whilst the DCS solution worked well and resulted in funding for river improvements, the capacity within both DCS1 and DCS2 has now reached its limit. The EA is currently undertaking an investigation of the impacts of pumping out on downstream river flows, as per the joint statement from the EA, NE and STW from November 2020 and a pump-out solution is aimed to commence by 2027.

3. New Approach

Until a longer-term solution can be found, additional phosphate entering the river, including discharges to ground will adversely affect the condition of the Mease SAC. The Habitats Regulations require that any development must not make the phosphate situation any worse than it already is, i.e., they must not have a Likely Significant Effect (LSE). For developments where there could be an LSE, then appropriate mitigation measures must be found. Developments must be able to demonstrate that their proposals would not increase the level of phosphate entering the River Mease and its catchment, to ensure that the water quality of the River Mease does not deteriorate further.

What this means for developers:

Now that the capacity within DCS1 and DCS2 has been used up, South Derbyshire District Council (SDDC) and North West Leicestershire District Council (NWLDC) are leading work

¹¹ [River Mease Special Area of Conservation - North West Leicestershire District Council \(nwleics.gov.uk\)](https://www.nwleics.gov.uk)f

with the Trent Rivers Trust to try and identify and cost appropriate phosphorous mitigation measures potentially in the form of a new DCS3.

In the interim period prior to DCS3 being agreed, where an increase in foul drainage discharge will occur, planning permission can only be granted when an appropriate bespoke mitigation solution has been designed into the application.

What this means for planners responding to advice:

4. Local Planning Authorities Role

Local Planning Authorities (LPAs) must consider the potential impact on the water quality of the River Mease when determining planning applications in the catchment. The previous “**standing advice (Oct 2017)**” can no longer be applied to developments which result in an increase in **foul and surface water** discharge. These will need to be considered and assessed against this new Standing Advice.

Once further appropriate mitigation measures have been identified for schemes that would increase the foul and surface water discharge from a site, where necessary, these measures must be implemented to prevent harmful discharges entering the river catchment during the construction and operation phases. These should be secured by planning conditions or legal agreements and enforced as necessary. LPAs must also ensure that applications comply with the Habitat Regulations and that Appropriate Assessments are carried out where necessary.

5. Q&As for dealing with planning applications within the Mease Catchment

Q: Which developments should LPAs consult Natural England on?

A: Where an application cannot be screened out entirely from an HRA, the LPA should consult Natural England in the first instance. Natural England will provide our advice and flag up any potential issues that the LPA must consider within their HRA. The LPA must then proceed to address these measures, having regard to this standing advice (and NE’s initial advice), then complete the HRA. The LPA must then reconsult NE with the HRA (For information only if no LSE is concluded, or as a formal consultation where LSE cannot be ruled out). Ideally the LPA should speak to developers at the earliest opportunity at pre-application stage to explain what evidence is needed to ensure that sufficient evidence is submitted to allow the LPA to be able to carry out an Appropriate Assessment.

Q: Will the applications within the Mease catchment need a Habitat Regulations Assessment?

A: Yes, all planning applications which result in an increase of foul or surface water discharge will require HRA screening.

Q: Will they require an Appropriate Assessment?

A: If any mitigation is necessary, an Appropriate Assessment will be required. Mitigation should be considered as any measures which are required to prevent an adverse impact on the river.

Q: Who carries out the Appropriate Assessment?

A: As the “competent authority” the LPA will need to prepare the Appropriate Assessment based on information submitted by the applicant.

Q: When should the Appropriate Assessment be carried out?

A: The Appropriate Assessment should be prepared once sufficient evidence has been submitted by the developer.

Q: What should an Appropriate Assessment achieve?

A: An Appropriate Assessment should evaluate and ensure that any scheme for mitigating against an increase in phosphate entering the SAC must be certain so that no reasonable scientific doubt remains as to the effects of the development on the Mease SAC.

Q: What type of bespoke mitigation measures would be acceptable?

A: Mitigation measures should result in the avoidance of impacts to the SAC, rather than compensating for the impacts once they have occurred. The mitigation needs to be for the lifetime of the development (unless there is certainty that other measures will address effects such as a pump out solution). Avoiding impacts is achieved by ensuring no increase in phosphate enters the SAC through the implementation of appropriate mitigation measures.

Appropriate Assessments and phosphate mitigation are discussed in more detail in section B.

B. Detailed information

1.0 The River Mease Site of Special Scientific Interest (SSSI) & Special Area of Conservation (SAC)

The River Mease is a relatively natural lowland clay river containing a diverse range of features including riffles, pools, slacks, vegetated channel margins and bankside tree cover which provide the conditions necessary to sustain nationally significant fish populations of spined loach *Cobitis taenia* and bullhead *Cottus gobio*. Other internationally important habitats and species reliant upon the river are its floating vegetation, white-clawed crayfish *Austropotamobius pallipes* and otter *Lutra Lutra*.

Under the Conservation of Habitats and Species Regulations 2017² (as amended³) (the 'Habitats Regulations'), the River Mease is designated as a Special Area of Conservation (SAC), requiring the highest level of protection, appropriate management, enhancement and where necessary, restoration. Published in 2018, Natural England's River Mease SAC Conservation Objectives⁴ and Supplementary Advice provide a framework for helping stakeholders achieve this, and to inform the local decision-making process.

The SAC and SSSI incorporates the lower reaches of the Gilwiskaw Brook downstream of Packington village (which are steep and fast flowing) and the River Mease itself from its confluence with the Gilwiskaw Brook to its confluence with the River Trent. The site is also notified at a national level, under the Wildlife and Countryside Act (1981) as amended as the River Mease Site of Special Scientific Interest (SSSI).

Although generally improving, the River Mease SSSI/SAC still needs to improve in several ways in order to allow it to meet its conservation targets. Improvements need to be made in areas such as:

- Point source water pollution;
- Diffuse water pollution (including, but not limited to surface water run-off, road run-off, agricultural and urban run-off and siltation);
- Impacts of non-native invasive species;
- Artificial modifications to the river channel.

Positive progress has been achieved by the River Mease Partnership⁵ in addressing many of the issues impacting the river by implementing the River Mease Restoration Plan⁶.

Levels of Orthophosphate in the river exceed the conservation limits of 0.04mg/l for the Gilwiskaw Brook and 0.05mg/l for the River Mease as agreed with the Environment Agency.

Development within the Mease catchment has the potential to further contribute to the poor water quality and siltation levels of the river as a result of additional surface and foul water.

2.0 Roles & Responsibilities

The public body responsible for determining a planning application is defined as the 'competent authority' under the Habitats Regulations. Where a Local Planning Authority

² <https://www.legislation.gov.uk/ukxi/2017/1012/contents/made>

³ <https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017>

⁴ <http://publications.naturalengland.org.uk/publication/6217720043405312>

⁵ <https://www.rivermease.co.uk/>

⁶ <https://www.rivermease.co.uk/wp-content/uploads/2015/04/River-Mease-Restoration-Plan.pdf>

(LPA) is the 'competent authority' for a planning proposal, it must only grant planning permission where it can be demonstrated that any European wildlife site will not be adversely affected, adopting the precautionary principle where there are any doubts. Where the development is likely to have a significant effect on a nationally or internationally designated nature conservation site, Natural England should be formally consulted for its advice. Additionally, where it is concluded there is no likely significant effect, Natural England should be consulted, for information only. This consultation should contain details of the application, as well as the HRA itself. Natural England will only respond if we disagree with the conclusion of the HRA

3.0 Habitats Regulations Assessment (HRA)

Under regulations 61 and 62 of the Habitats Regulations the 'competent authority' must follow a series of steps and tests for plans or projects which could potentially affect a European site. These steps and tests are collectively referred to as the 'Habitats Regulations Assessment' process.

The essential first step in determining a planning application within the River Mease catchment is to screen the proposal for any likely significant effects on the SAC. In accordance with case law, a HRA should consider an effect to be 'likely' if it 'cannot be excluded on the basis of objective information' and is 'significant' if it 'undermines the conservation objectives' of the site (referred to above). In plain English, the test asks whether the plan or project 'may' have a significant effect (i.e., there is a risk or a possibility of such an effect).

Where significant effects can't be ruled out, the next step is a more detailed ecological assessment (an Appropriate Assessment) which must be carried out by the 'competent authority' in order to ascertain that the plan or project would have no adverse effect on the site's integrity in view of the site's conservation objectives. If such effects cannot be ruled out, permission may not be granted unless the additional tests given in Regulations 62 and 66 of the Habitats Regulations can be satisfied.

It is the responsibility of those applying for permission to provide such information as the competent authority may reasonably require to undertake its HRA. When undertaking a Habitats Regulations Assessment, the precautionary principle applies. This means that if a plan or project *could* adversely affect a European site, the person doing the HRA has to have evidence to prove that it will not, before ruling out that likely effect. If there is uncertainty, then it is assumed that the likely effect will occur. The Government has produced guidance for competent authorities and developers to assist with them with the Habitats Regulations Assessment process. Please refer to the following link:

<https://www.gov.uk/guidance/appropriate-assessment>

3.1 Recent Rulings

Competent authorities undertaking HRAs should be aware of the ruling made by the Court of Justice of the European Union (the CJEU) on the interpretation of the Habitats Directive in the case of People Over Wind and Sweetman vs Coillte Teoranta (ref: C-323/17). The case relates to the treatment of mitigation measures at the screening stage of an HRA when deciding whether an appropriate assessment of a plan/project is required. The Court's Ruling goes against established practice in the UK that mitigation measures can, to a certain degree, be taken into account at the screening stage.

As a result, Natural England advises that any "embedded" mitigation relating to protected sites under the Habitat Regulations 2017 Regulation 63 (1) should no longer be considered at the screening stage, but taken forward and considered at the appropriate assessment stage to inform a decision as whether no adverse effect on site integrity can be ascertained.

In light of the recent case law, any reliance on measures intended to avoid or reduce harmful effects at the likely significant stage is vulnerable to legal challenge.

On 7 November 2018, the CJEU handed down its judgment on the joined [Coöperatie Mobilisation for the Environment cases](#) (often referred to as the Dutch Nitrogen cases) which related to nitrogen deposition from air pollution (however it is also relevant to water pollution). The court concluded that where the conservation status of a natural habitat is unfavourable, the possibility of authorising activities which may subsequently affect the ecological situation of the site seems “*necessarily limited*”. The other key aspect of this case is “certainty”. Certainty is made up of different elements, broadly: scientific certainty that a measure is capable of working or achieving the required reductions, and practical certainty that it is going to be in place at the relevant time (i.e. it is clear when the necessary actions will be taken, by whom, that there is adequate funding, or that the necessary rights over land exist). Natural England considers the reference to “certainty” in the Dutch Judgment should be read in light of the “Waddenzee test” that competent authorities should only authorise a plan or project if they have made certain that it will not adversely affect the integrity of the site. This means that no reasonable scientific doubt remains as to the absence of effects.

Natural England recommends that legal advice is sought over the implications of these judgements.

4.0 Foul Water Drainage

4.1 Mains Drainage Solutions:

Natural England’s preference for development generally is for foul drainage to be connected to the mains sewer where available. Since 2012, the approach taken to tackle the impact of additional foul drainage, discharging via the mains sewer system, on the SAC was to implement a Developer Contribution Scheme (DCS). However, the capacity within DCS1 and DCS2 has now reached its limit although there may be scope for developments to be accommodated within these schemes where previous permissions have lapsed. Further investigations are now being undertaken by the Environment Agency and a pump-out solution is aimed to commence by 2027 for two key Severn Trent Water sewage treatment works at Packington and Measham.

As pumping out is only proposed for Packington and Measham treatment works then several other treatment works will still have an unacceptable effect – i.e. in South Derbyshire all development going to Overseal, Netherseal or Smisby will need to mitigate for additional development and similarly the North West Leicestershire treatment works of Donisthorpe, Snarestone and Chilcote.

Whilst there is still some capacity within the existing licences at both Measham and Packington STW and the other treatment works in the catchment, the additional phosphate generated by further development will have to be mitigated for in order to ensure that the water quality of the River Mease, which is currently failing WQMS standards, does not get worse. Therefore planning permission cannot be granted for developments within the Mease SAC catchment area that would increase the foul drainage discharge from a site to the mains sewer until:

A - appropriate phosphate mitigation measures have been agreed by Natural England, the Environment Agency, Severn Trent Water, and the LPAs; or

B - appropriate bespoke measures to mitigate against increased phosphate levels in the SAC are proposed by developers and it is demonstrated that the development would not result in adverse impacts on the SAC; or

C - a permanent solution of either pumping foul sewage out of the catchment or increasing the capacity and technology of the STW can be implemented.

Even then if the SAC still does not meet its targets due to remaining sources, then appropriate mitigation measures will still be needed until there is a strategic plan that is certain enough that it will restore the site and create capacity for development.

The current uncertainty about the impact of new development on the Mease SAC needs to be recognised for all development proposals that are subject to new planning permissions and have inevitable wastewater implications. These implications, and all other matters capable of having a significant effect on the River Mease SAC, must be addressed in line with Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (See HRA advice above).

4.2 Interim Phosphate Mitigation Measures

The main issue of concern with phosphate in the water environment is freshwater eutrophication. Eutrophication occurs when the nutrient enrichment creates excessive algal/plant growth, having an adverse impact on ecology and water use. The main sources of phosphate in rivers and lakes are point source sewage effluent and diffuse run-off from agricultural land, roads and urban areas.

South Derbyshire District Council (SDDC) and North West Leicestershire District Council (NWLDC) are leading work with the Trent Rivers Trust to identify and cost appropriate mitigation measures potentially in the form of a new DCS and bespoke solutions to provide limited short-term capacity for development across the catchment. Bespoke solutions to mitigate phosphate levels could also be prepared by developers themselves.

Bespoke mitigation measures should result in the avoidance of impacts to the SAC, rather than compensating for the impacts once they have occurred. The mitigation needs to be for the lifetime of the development (unless there is certainty that other measures will address effects such as a pump out solution). Avoiding impacts is achieved by ensuring no increase in phosphate enters the SAC through the implementation of appropriate mitigation measures. Such mitigation measures would need to be secured through planning conditions or legal agreements.

4.3 Non-Mains Drainage Solutions:

Where a non-mains drainage solution is proposed, the LPA should satisfy itself that the drainage solution proposed, whether a package treatment plant, septic tank or sealed cesspit, will not result in any harmful discharges of foul water from the application site into the River Mease or its tributaries i.e., does not have a Likely Significant Effect. This will form an integral part of the Habitats Regulations Assessment (HRA). Effluent discharging from package treatment plants and septic tanks will contain high phosphate levels meaning that additional treatment and mitigation measures are required to ensure the discharge is of an appropriate quality before it enters the water environment. Figure 1 below sets out the necessary criteria for a drainage field which would provide suitable mitigation for discharges from PTPs or septic tanks. Alternative bespoke mitigation may be possible for non-mains drainage solutions, however this would need to be designed, and its efficacy evidenced, by the developer. We would expect the deployment of the most technologically advanced solutions for non-mains drainage systems.

Where no other options are possible, the use of a cesspit can be permitted, subject to the LPA being satisfied that the cesspit will not be emptied within the River Mease catchment (including via wastewater treatment works). The LPA must also satisfy itself that any non-mains drainage solution proposed will function for the lifetime of the development, i.e., it will be suitably maintained.

For minor developments (less than 10 dwellings or for all other uses less than 1000 square metres or where the site area is less than one hectare) the application should be accompanied by a Foul Drainage Assessment Form – which can be found at <https://www.gov.uk/government/publications/foul-drainage-assessment-form-fda1>. We also advise the LPA to assess such schemes against the Environment Agency's Advice for Local Authorities on Non-Mains Drainage from Non-Major Development which can be found at http://ecab.planningportal.co.uk/Uploads/EA_LPA_advice_non_major_dev_non_mains_draiage_2019.pdf. It is worth noting that where discharges to ground are proposed, schemes should also be assessed against Natural England's criteria for discharges to ground (set out in Fig. 1 below), as these differ slightly from those set out within the EA's guidance, and are designed to provide a precautionary approach specifically to prevent adverse impacts on Phosphorous sensitive freshwater sites.

The EA have recently updated their 'General Binding Rules: small sewage discharge to the ground'⁷, which set out the rules for considering non-mains drainage systems within the environmental permit system, administered by the EA. This should be referred to by developers during the design of non-mains drainage systems which discharge to ground.

For major development (10 or more dwellings, or for all other uses more than 1000 square metres or where the site area is one hectare or more) we advise the LPA to seek confirmation from the Environment Agency (EA) that the foul water drainage solution proposed is technically fit for purpose. It may also require an environmental permit and any mitigation measures would need to pass other tests the EA apply for other regulations not just the Habitat Regulations requirements.

A summary report of Natural England's research⁸ on small sewage discharges and the risk to protected sites is available online, please see link in the footnote below.

The box below sets out the Likely Significant Effect (LSE) criteria for discharges to ground:

Fig. 1

Small discharges to ground i.e. less than 5m³/day that are within the surface or groundwater catchment of a designated site (i.e. the River Mease SAC and River Mease SSSI) will present a low risk that the phosphorus will have a significant effect on the designated site where certain conditions are met:

- The drainage field is more than 50m from the boundary of the River Mease SAC and River Mease SSSI; and;
- The drainage field is more than 40m from any surface water feature which drains to the River Mease SAC/SSSI, e.g., ditch, drain, watercourse, and;
- The drainage field in an area with a slope no greater than 15%, and;
- The drainage field is in an area where the high-water table groundwater depth is always at least 2m below the surface and;
- The drainage field will not be subject to significant flooding, e.g., it is not in flood zone 2 or 3 and;
- There are no other known factors which would expedite the transport of phosphorus for example fissured geology, known sewer flooding, conditions in the soil/geology that would cause remobilisation of phosphorus, presence of mineshafts, etc and;

⁷ <https://www.gov.uk/guidance/general-binding-rules-small-sewage-discharge-to-the-ground#rules-for-existing-and-new-discharges>

⁸ <http://planning.southkesteven.gov.uk/SKDC/S20-0383/1823861.pdf>

g) To ensure that there is no significant in combination effect, the discharge to ground should be at least 200m from any other discharge to ground. The density of discharges to ground should also not be greater than 1 for every 4ha (or 25 per km²).

5.0 Surface Water Drainage

Where practicable, our preference remains for surface water from new roofs, converted roofs, new hard surfacing etc. to be disposed of harmlessly on site in a sustainable way by means of a Sustainable Urban Drainage System (SuDS), incorporating a water quality treatment chain that is designed to address the specific contaminants expected to be generated by the proposed development in order to clean the water.

As part of the Habitats Regulations Assessment (HRA), the LPA should satisfy itself that the sustainable drainage scheme proposed will not result in any harmful discharges into the River Mease or its tributaries. If the LPA is satisfied that a development would not have a Likely Significant Effect, then they would not need to consult Natural England.

In considering if any proposed SUDS scheme for major developments is able to achieve the two functions of flood risk attenuation and protection of the water quality of the River Mease, the LPA should refer to the relevant Lead Local Flood Authority (LLFA) on flooding matters and should use the **SUDS standing advice** from Natural England in **Annex A**.

Maintenance of the sustainable drainage system proposed is essential to ensure that it continues to function as designed and constructed. The long-term monitoring and maintenance of the surface water drainage system must be secured by condition or legal agreement.

Where there is a risk of surface water runoff into the River Mease from the application site, either during construction or operation, pollution prevention measures should be introduced to prevent substances such as petrol, oil, suspended sediments or bankside material from entering the River Mease or its tributaries. Refer to CIRIA Guidance on SuDS treatment trains. There is no requirement to consult Natural England on applications in close proximity to the River Mease or its tributaries provided that pollution prevention measures of this kind are secured by condition or legal agreement.

It is also worth noting that where works are proposed on the main river, an EA FRAP permit may be required; where works are proposed on an ordinary watercourse, a consent from the LLFA may be required.

6.0 Construction Method Statements

If the construction work associated with a development proposal could have a potential impact on the River Mease SAC/SSSI we advise that a condition to the following effect is placed on the application:

- A Construction Method Statement and/or Surface Water Management Plan explaining the measures in place to protect the River Mease and its tributaries from any harmful discharges during construction should be submitted and approved by the LPA before any work takes place.

The LPA should satisfy itself that the CMS would prevent any harmful discharges into the River Mease or its tributaries as part of its Habitats Regulations Assessment (HRA). This should include, but not be limited to, impacts from sediment mobilisation and oil/fuel spills. If the LPA is satisfied, Natural England does not need to be consulted.

ANNEX A - NATURAL ENGLAND'S SUSTAINABLE URBAN DRAINAGE SYSTEM (SUDS) STANDING ADVICE

A1. General Principles for SuDS Proposals in the River Mease Catchment

Guidance on sustainable drainage systems, including the design criteria, can be found in the CIRIA SuDS Manual (2015) C753 (or latest updated version). The expectation is that the level of provision will be as described for the highest level of environmental protection outlined within the guidance. For discharge to any waterbody within the River Mease catchment the 'high' waterbody sensitivity should be selected.

The SuDS manual states that 'where the discharge is to protected surface waters or groundwater, an additional treatment component (i.e. over and above that required for standard discharges), or other equivalent protection, is required that provides environmental protection in the event of an unexpected pollution event or poor system performance'⁹. Therefore, Natural England advise that one additional SuDS component should be provided where a development lies within the catchment of any designated site.

In order to understand what mitigation is required the first step is to decide which approach for managing pollution risk is appropriate for a proposed site. Table 4.3 of the CIRIA SuDS manual sets out how to decide which approach to use depending on the proposed land use. Most housing developments should include at least 3 treatment trains which are designed to improve water quality. The number of treatment trains will be higher for industrial developments.

The next step is to determine the Pollution Hazard Index of the proposed site, a table of each land use and its associated Pollution Hazard Index is contained in table 26.2 of the SuDS manual.

In order to demonstrate that the proposed land use will not have an impact on the SAC the Pollution Mitigation Index score must be equal to or greater than the Pollution Hazard Index. Each SuDS component's Pollution Mitigation Index score is provided in table 26.3 of the SuDS manual.

If one component is not sufficient to match the Pollution Hazard Index, then a series of SuDS components will be required to achieve required score. A treatment train is used to capture, convey, and store surface water while delivering interception and pollution risk management. Not all SuDS components are suitable for each function listed above so the suitability of each component for specific functions is outlined in table 26.7 of the SuDS manual.

If a treatment train is required then each SuDS component after the primary component must have its score reduced by 50%, this is to account for the reduced flow concentration.

SuDS features may lose effectiveness over time and require regular maintenance to ensure optimal efficiency. As this surface drainage strategy will form part of a mitigation package to address effects on the River Mease, ensuring its maintenance over the lifetime of the development will be necessary to ensuring compliance with the Habitats Regulations.

We recommend that a long term monitoring and maintenance strategy is submitted to satisfy the competent authority that the SuDS system will operate effectively for the lifetime of the development. Such a strategy should consider appropriate responsibilities and mechanisms to ensure compliance for the lifetime of the development. We recommend that consideration

⁹ CIRIA SuDS Manual, Chapter 26, Page 571

is given to monitoring, maintenance and securing of corrective measures as necessary. Such a plan should be agreed with the local authority.

A2. The Simple Index Approach (SIA)

CIRIA has worked with partners to produce a tool that allows developers and LPA's to quickly determine whether or not a proposed scheme will be effective in treating surface water quality to prevent damage to the SAC. Most of the proposed developments within the River Mease SAC catchment would allow for the simple index approach to be used to assess the suitability of the proposed SuDS.

The SIA tool is user friendly and will remove the need for an in depth understanding of the SuDS manual in most cases. The tool can be downloaded for free from this [link](#).

The tool provides a quick and reliable result that will give decision makers certainty of the suitability of a proposed scheme. However, it does not account for the sensitivity of the receiving waters so as mentioned above one additional SuDS component must be provided.

A2. Types and Sources of Surface Water Pollution

There are many different sources of surface water pollution. Industrial and agricultural activities deposit pollutants in the atmosphere which can be absorbed in rainwater, deposited on and absorbed by hard surfaces and transported to the nearest watercourse. The same applies to vehicle emissions. Traffic can also deposit pollutants, including leaks and spillages of fuel, engine oil and other harmful substances, on roads and car park surfaces. Car and lorry tyres pick up and spread harmful materials, including animal waste, from roads and other hard surfaces. Even seemingly innocent activities such as car washing can result in harmful deposits of oil, cleaning materials and dirty water finding their way into watercourses.

Soil erosion can increase the likelihood of harmful pollutants entering watercourses through runoff. Where there is a risk of surface water runoff into the River Mease from the application site, pollution prevention measures should be introduced to prevent substances such as petrol, oil, suspended sediments or bankside material from entering the River Mease or its tributaries.

In view of the multiple sources of surface water pollution, the list of potential pollutants is equally lengthy, including any combination of the following - phosphates, nitrates, sulphates, chlorides, heavy metals, hydrocarbons, glycols, alcohols, oils, salts, detergents, herbicides, insecticides, fungicides, organic matter, bacteria, viruses, particulates, sediment and various other chemicals. The potential harm to any sensitive watercourse, the River Mease included, from any combination of these pollutants is considerable.

A3. Design Criteria for SuDS

Sustainable urban drainage systems should fulfil the following design criteria. They must help to manage water quantity and control water quality and should be designed to provide an amenity and support biodiversity.

Water Quantity: Use surface water as a resource, support the management of flood risk, protect the morphology and ecology of the receiving water bodies, drain the site effectively and build flexibility into the system to cope with future change.

Water Quality: Support the management of water quality in receiving surface and groundwater, create resilience to adapt to future change. The core interest of Natural England in the River Mease will be pollution management of waters emanating from a SuDS

into the SAC receptor site. It is important to remember that this will include discharges into water bodies that enter the SAC itself further downstream.

Amenity: Sustainable drainage systems should act as an amenity by enhancing visual character, providing multi-functionality and supporting community development.

Biodiversity: Protect and enhance habitats and species, contribute to the delivery of biodiversity objectives, contribute to habitat connectivity, create diverse, self-sustaining and resilient ecosystems.

LPAs should consider the incorporation of SUDS features into the green infrastructure provision of all developments. Natural England have recently launched a new GI mapping System¹⁰ which may be a useful tool for LPAs.

A4. Sustainable Drainage Systems

There are various types of sustainable drainage system with different characteristics and functions.

Rainwater harvesting systems capture rainwater for use within buildings such as toilet flushing.

Pervious surface systems such as green roofs or permeable paving permit water percolation to reduce surface water runoff. The water can be stored in sub-surface storage or treatment tanks.

Infiltration systems allow the harmless disposal of water into the ground. Temporary storage can be created to retain the water for slow release into the ground.

Conveyance systems such as swales can be used to channel runoff into storage systems, often controlling the flow rate and volume of water dispersed.

Storage systems can be used to store water and control flows. They can be used for attenuation, i.e. slow release. Some storage systems such as ponds, wetlands and detention basins can be used to provide water treatment before release into the water environment.

Pre-treatment systems such as filter strips, dry swales, detention basins and sediment sumps can be used to remove silt, sediment & debris from surface water before it travels to the next treatment train.

Treatment systems are specifically designed to purify the water of pollutants to prevent the contamination of rivers and watercourses.

A5. SuDS Treatment Trains

A well-designed surface water management strategy is likely to consist of a combination of the sustainable drainage systems listed above and SuDS treatment trains. Pervious surface systems such as green roofs or permeable paving can reduce and steady the flow of surface water runoff. A conveyance system using filter strips or filter swales can be used to guide surface water to a storage or infiltration system. Storage systems can be used to store water and control flows. They can be used for attenuation, i.e. slow release. Some storage systems such as ponds, wetlands and detention basins can be used to provide water treatment before release into the water environment. Filter strips, dry swales, detention basins and sediment sumps can be used to remove silt, sediment & debris from surface water before it finds its way to a watercourse or retention basin.

The suitability of any surface water drainage system will depend on the size and type of development. It follows that the SuDS design should reflect these considerations. As a rule, the larger the development and the closer to the River Mease and its tributaries, the greater the number and scale of treatment trains required to prevent any harmful discharges into the catchment. The permeability and topography of the land also needs to be taken into consideration. Refer to CIRIA Guidance on SuDS treatment trains.

¹⁰ <https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Home.aspx>

A6. HOW TO ASSESS THE EFFICACY OF SUDS PROPOSALS

A6.1. Key Factors to be taken into Account

- a) Water quality issues within the River Mease SAC/SSSI and the potential risk factors
- b) Potential sources of surface water pollution from the proposed development
- c) Water pathways from the development site to the River Mease SAC/SSSI, known as the “hazard pathway”
- d) Suitability of the proposed surface water treatment train
- e) The residual impacts of the proposal once the above factors have been taken into account.

A6.2. Water Quality Issues in the River Mease SAC/SSSI & the Potential Risk Factors

The River Mease currently suffers from the effects of point source and diffuse water pollution which includes, but is not limited to, surface water run-off, road run-off, agricultural run-off and run-off from the urban environment. Levels of phosphates (p) in the river exceed the recognised conservation limits of 0.04mg/l for the Gilwiskaw Brook and 0.05mg/l for the River Mease as agreed with the Environment Agency. Heavy metals are also currently exceeding environmental standards (EQS) and probable likely effect (PEL). Any development proposal within close proximity of the River Mease or its tributaries could have likely significant effects on the River Mease SAC/SSSI which need to be ruled out or mitigated before planning permission is granted.

A6.3. Potential Sources of Surface Water Pollution from the Proposed Development

The pollution hazards might include any combination of the following - phosphates, nitrates, sulphates, chlorides, heavy metals, hydrocarbons, glycols, alcohols, oils, salts, detergents, herbicides, insecticides, fungicides, organic matter, bacteria, viruses, particulates, sediment and various other chemicals. The potential sources of water pollution range from surface water run-off to road run-off, agricultural run-off and run-off from the urban environment.

A6.4. Hazard Pathway: Water Pathways from the Development Site to the River Mease SAC/SSSI

These might include roads, hard standing, service areas including petrol stations, industrial areas, lorry parks, car parks, gardens, amenity areas etc. Only hazards with a pathway to the River Mease SSSI/SAC need to be mitigated by the SuDS treatment train.

A6.5. Suitability of the Proposed Surface Water Treatment Train

Treatment Train suitability will be affected by the:

- Number of required components in the Train;
- Type of development;
- Suitability of Train components to manage SuDS identified water quality hazards (for example, types of organic contaminants and/or heavy metals etc. – different hazards may need specific treatment.

General guidance on these factors is to be found in the CIRIA Guidance on SuDS treatment trains. Extracts are added below.

| Source of Surface Water Pollution | Number of Treatment Train Components Required |
|---|--|
| Roofs only | 1 |
| Residential roads, parking areas, commercial zones. | 3 |
| Refuse collection areas, industrial areas, loading bays, lorry parks, main highways | 4 |

A6.6. SuDS Components to Deal with Specific Pollutants Most SuDS components cope with some pollutants better than others. The following are some general rules of thumb.

Hydrocarbons (Oils, fats, greases, lubricants, tyre and rubber residues, fuels and organic solvents etc.) - Such contaminants can be derived from runoff coming from major roads, industrial areas, hard standings, bus stations, in fact anywhere that experiences significant levels of vehicle movement or could be used to store and/or process such chemicals. In most cases, the risk these chemicals pose to the River Mease is highly significant and a SuDS treatment train would need to incorporate features that either remove or contain the risk. This is usually achieved by the use of physical traps and barriers, but such mechanisms require regular maintenance and the physical removal and appropriate permitted disposal of pollutant liquors etc.

Particulates and Particulate Bound Pollutants such as Faecal Indicator Organisms - If well designed and maintained, most SuDS systems can be expected to cope with particulate matter and pollutants that readily bind with particulates. These include organic pollutants that may be derived from the transfer of animal wastes to surface waters. Other particulates may be sediments and/or residues derived from industrial processes.

Heavy Metals - Heavy metals such as Cadmium, Copper, Lead, Zinc, Chromium and Nickel are significant contaminants from roads. The higher the traffic levels, the higher the likely risk of heavy metal contaminants in any runoff. It may be possible to treat low levels of heavy metal contamination effectively using specially designed filter strips and drains incorporating the use of weathered gravels capable of absorbing metal ions into exposed clay minerals. However, such techniques alone are unlikely to deal with high concentrations of contaminants or high rates of runoff which are likely to require the use of Retention Ponds and/or Constructed Wetlands to trap heavy metals for periodic sediment removal.

Soluble Pollutants (Nitrates and Phosphates) - Some SuDS components can be reasonably effective at coping with N and P pollutants. However, there is less evidence of this when it comes to the levels of sensitivity that many Water Dependent Designated Sites (WDDS), such as the Mease. In the Mease catchment local planning authorities should examine in detail how these pollutants will be dealt with by a sustainable surface water drainage system. Where there is any doubt about the efficacy of the SuDS arrangements, it may be appropriate to consider the use of specific Constructed Wetlands (which have a higher N and P coping capability but may require significant land take and maintenance and be more expensive than more usual SuDS components). Specialist advice will be required in such circumstances.

Salts (such as road salt run off) - SuDS struggle to mitigate highly soluble pollutants like salts. Salt laden runoff is likely to require specific SuDS to contain such runoff and deal with by retention and evaporation or regular physical removal and authorised disposal.

A7. SuDS Assessment: Worked Example

A7. SuDS Assessment: Worked Example 5-Step SuDS Assessment: the LPA has been consulted on a development proposal for a small housing development consisting of 8 dwellings on agricultural land on the outskirts of Measham, Leicestershire. The development site is less than 50 metres from the River Mease SSSI/SAC. The foul water drainage is to be connected to the existing mains sewer serving an existing residential development nearby. A sustainable drainage system (SuDS) is proposed for the disposal of surface water from the development site.

| | |
|---------------|---|
| Step 1 | List the Water Dependent Designated Sites (WDDS) risk factors |
| | The River Mease SSSI/SAC is currently failing to meet water quality targets necessary to achieve favourable condition and favourable conservation status. It has high phosphate levels and remains at risk from sedimentation, heavy metals and PAH. |
| Step 2 | For each risk factor, identify any related development generated potential hazards |
| | As well as new roofs, the proposal includes vehicle hard standing and new gardens. The pollution hazards include suspended solids, phosphate (bound to soils from car tyres etc.), heavy metals and hydrocarbons. Runoff of fertilisers from new lawns poses an additional pollution risk. |
| Step 3 | Undertake a simple spatial analysis of potential hazards generated by the development and identify the SuDS “hazard pathway” (how the SuDS could connect the hazard to the site thus incurring a risk) |
| | The development site is located within 50 metres of the River Mease. There are new roofs, gardens and new hard standing areas from which harmful discharges of surface water can be transported to the River Mease. At a minimum 3 treatment components are required given the sensitivity of the River Mease, the proximity of the development site and the nature and scale of the development proposal. |
| Step 4 | For identified relevant “hazard pathways”, review the suitability of the SuDS Treatment Chain components for dealing with identified hazards |
| | The proposed SuDS arrangements include a rainwater harvesting system to capture rainwater for toilet flushing in the new dwellings, filter strips, dry swales, detention basins and sediment sumps to remove silt, sediment & debris from surface water and a retention pond to which the surface water will be directed by means of dry swales. The water will then be treated to remove pollutants and prevent any risk of harmful discharges into the River Mease. |
| Step 5 | Identify any Residual Risk Impacts where Treatment Chain does not look as if it will manage risk impacts sufficiently |

| | |
|----------------------------|---|
| | <p>The SuDS treatment train has been specifically designed to avoid the risk of harmful discharges into the River Mease given the scale and nature of the development and its proximity to the River Mease. In theory, the measures proposed should be capable of dealing with the potential hazards generated by the new development provided each component is properly maintained.</p> |
| <p>Conclusions:</p> | <p>The proposed treatment train would appear to be suitable for the development proposal provided that each component is properly monitored and maintained. The LPA do not need to consult</p> |

A8. SuDS Case Studies: Useful Links

<http://urbanwater-eco.services/project/uk-suds-tools-website/>

https://www.susdrain.org/files/resources/Presentations/reuka_gunasekara_170608_.pdf

Please note that the information contained in this document has used up to date information that was available in January 2022.